

# Monthly Marine Biotoxin Report

July 2005

Technical Report No. 05-20

## INTRODUCTION:

This report provides a summary of biotoxin activity for the month of July 2005. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

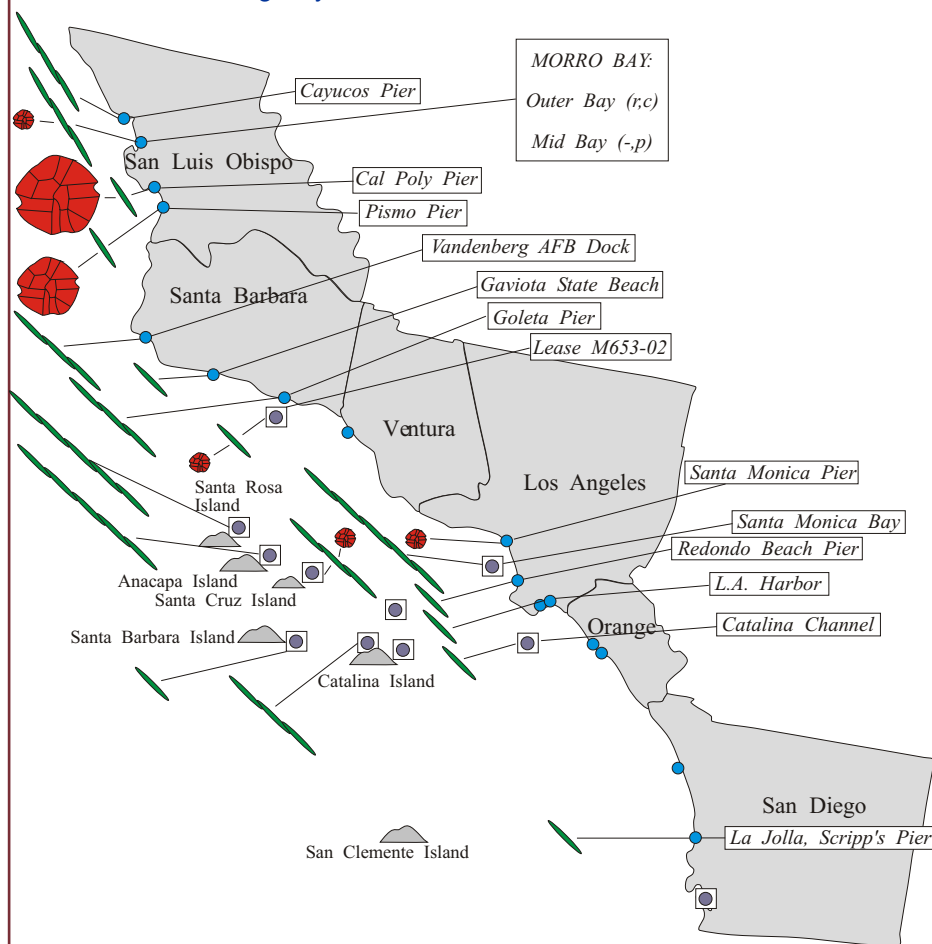
### Southern California Summary:

#### Paralytic Shellfish Poisoning

*Alexandrium* was observed at several Southern California sites during July (Figure 1). The distribution of this toxin-producing

(Continued on Page 2)

Figure 1. Distribution of toxin-producing phytoplankton in Southern California during July, 2005.



### Relative Abundance of Known Toxin Producers

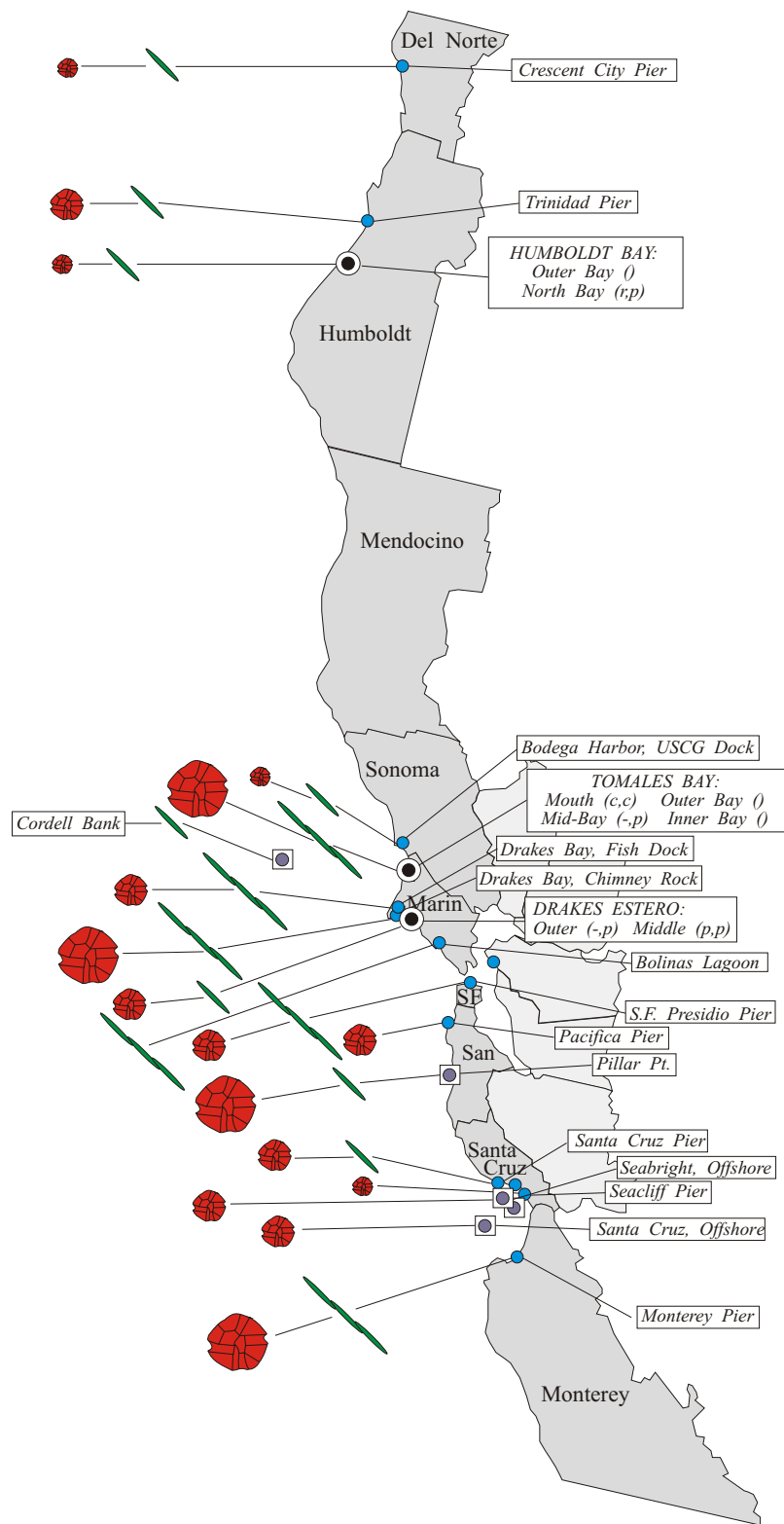
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (less than 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

### MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:  
(a,p) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.  
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during July, 2005.



(Continued from Page 1)

dinoflagellate was similar to observations in June, however the relative abundance continued to increase at the Cal Poly Pier in Avila (southern San Luis Obispo County). The highest concentrations of *Alexandrium* were observed towards the latter part of the month (July 17). *Alexandrium* was also detected in low numbers between Santa Barbara and Los Angeles.

Despite the high numbers of *Alexandrium*, mussels from Avila contained only low concentrations of PSP toxins by the last week of the month (Figure 3). Low levels of these toxins were also detected at sites in Santa Barbara and Ventura counties.

#### Domoic Acid

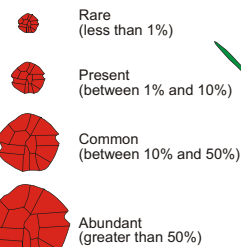
*Pseudo-nitzschia* was observed at sites along the entire Southern California coast in July (Figure 1). The relative abundance of this diatom increased at some sites along the coast of Los Angeles and offshore near Catalina Island. This diatom remained abundant offshore in samples from the Santa Barbara Channel and near Santa Cruz Island, as well as at sites along the Santa Barbara coast. Only low numbers of *Pseudo-nitzschia* were observed at sites along the Orange and San Diego coast.

Domoic acid continued to be absent from

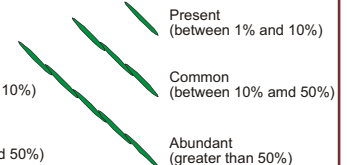
(Continued on Page 3)

#### Relative Abundance of Known Toxin Producers

##### Alexandrium Species



##### Pseudo-nitzschia Species



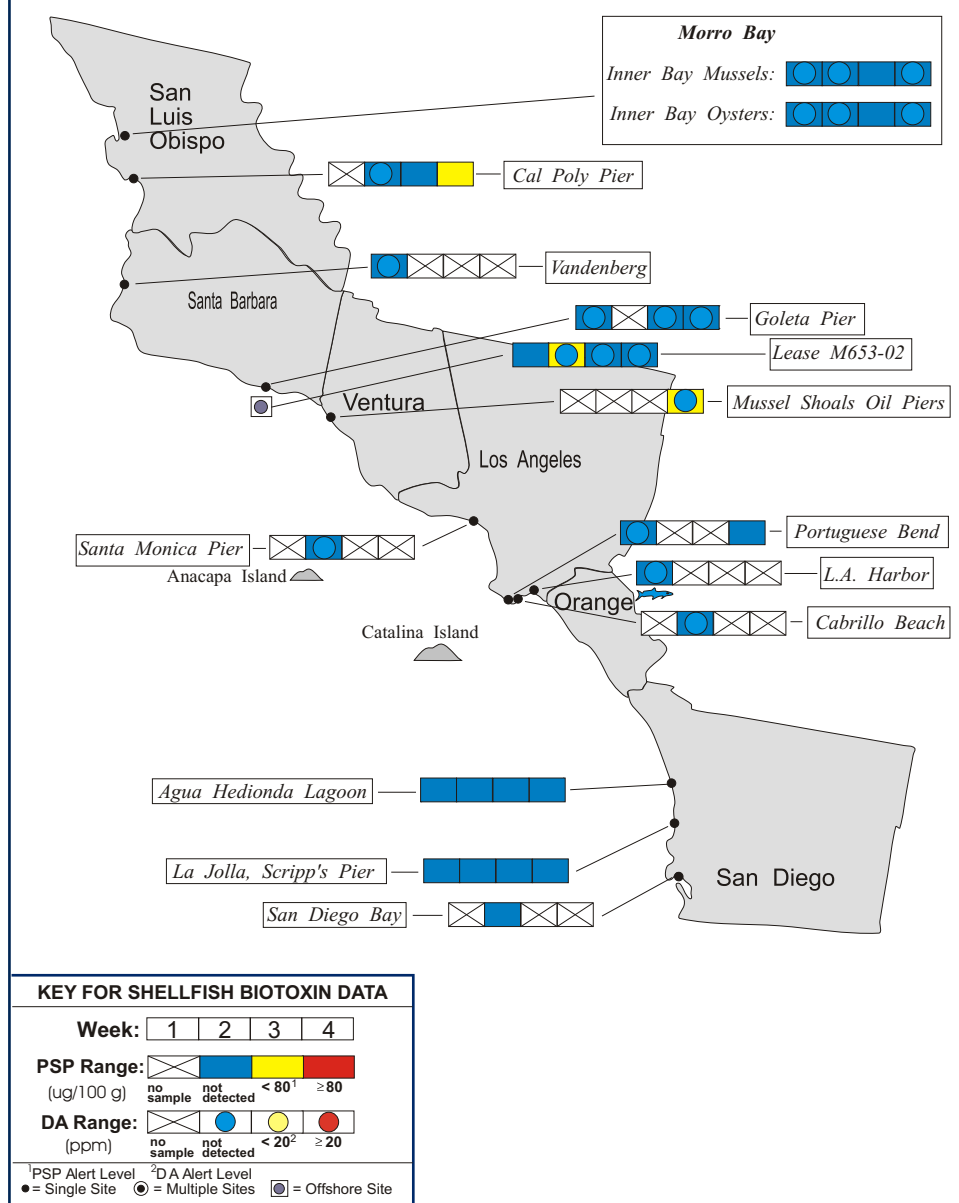
#### MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:

(A,P) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.  
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 3. Distribution of shellfish biotoxins in Southern California during July, 2005.



(Continued from Page 2)

samples collected along the coast. Unfortunately shellfish samples were not available from those locations with the highest abundances of this toxic diatom.

#### Non-toxic Species

A variety of diatoms (*Chaetoceros*, *Rhizosolenia*, *Melosira*) continued to dominate the assemblage along the coast from San Luis Obispo to Point Conception. South of this region dinoflagellates were dominant. *Ceratium*, *Prorocentrum*, *Cochlodinium*, and *Gymnodinium* were common along the Southern California coast. *Lingulodinium polyedrum* remained abundant at several sites from Los Angeles through San Diego. The offshore sites near the Channel Islands were dominated by diatoms, including *Bacteriastrum* and *Chaetoceros*.

#### Northern California Summary:

#### Paralytic Shellfish Poisoning

*Alexandrium* distribution and relative abundance increased dramatically in July, particularly along coast between Bodega Bay (Sonoma County) and Monterey Bay. The highest relative abundance of *Alexandrium* was detected by the last week of July at the sentinel station in Drakes Bay. Lower numbers of this dinoflagellate were

(Continued on Page 4)

The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Health Services, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:  
(510) 412-4635

For Recorded Biotoxin Information Call:  
(800) 553-4133

(Continued from Page 3)

also observed at sites along the coast of Del Norte and Humboldt counties.

The elevated concentrations of PSP toxins detected in the Drakes Bay region during the last week of June continued to increase in July (Figure 4). The highest toxin concentrations detected were in sentinel mussels from Drakes Bay (879 ug) and Drakes Estero (616 ug). Toxin concentrations above the federal alert level were also detected at sites in San Francisco and Santa Cruz counties.

### Domoic Acid

*Pseudo-nitzschia* was observed at most sampling stations along the Northern California coast in July (Figure 2). The relative abundance of this diatom increased at some sites in Marin and San Francisco counties and decreased at Crescent City and at several sites inside Monterey Bay.

Low levels of domoic acid continued to be detected in razor clams from Clam Beach (Humboldt County).

### Non-toxic Species

Diatoms remained the dominant group at most stations. There was a significant bloom of *Guinardia* along the coast of Del Norte and Humboldt counties. Common diatoms elsewhere included *Skeletonema*, *Chaetoceros*, and *Ditylum*. In contrast, dinoflagellates were common inside Monterey Bay near Santa Cruz and included *Prorocentrum*, *Gymnodinium*, and *Ceratium*.



### QUARANTINES:

The June 24 health advisory remained in effect, warning the public not to eat mussels or the viscera of sardines,

(Continued on Page 5)

Figure 4. Distribution of shellfish biotoxins in Northern California during July, 2005.

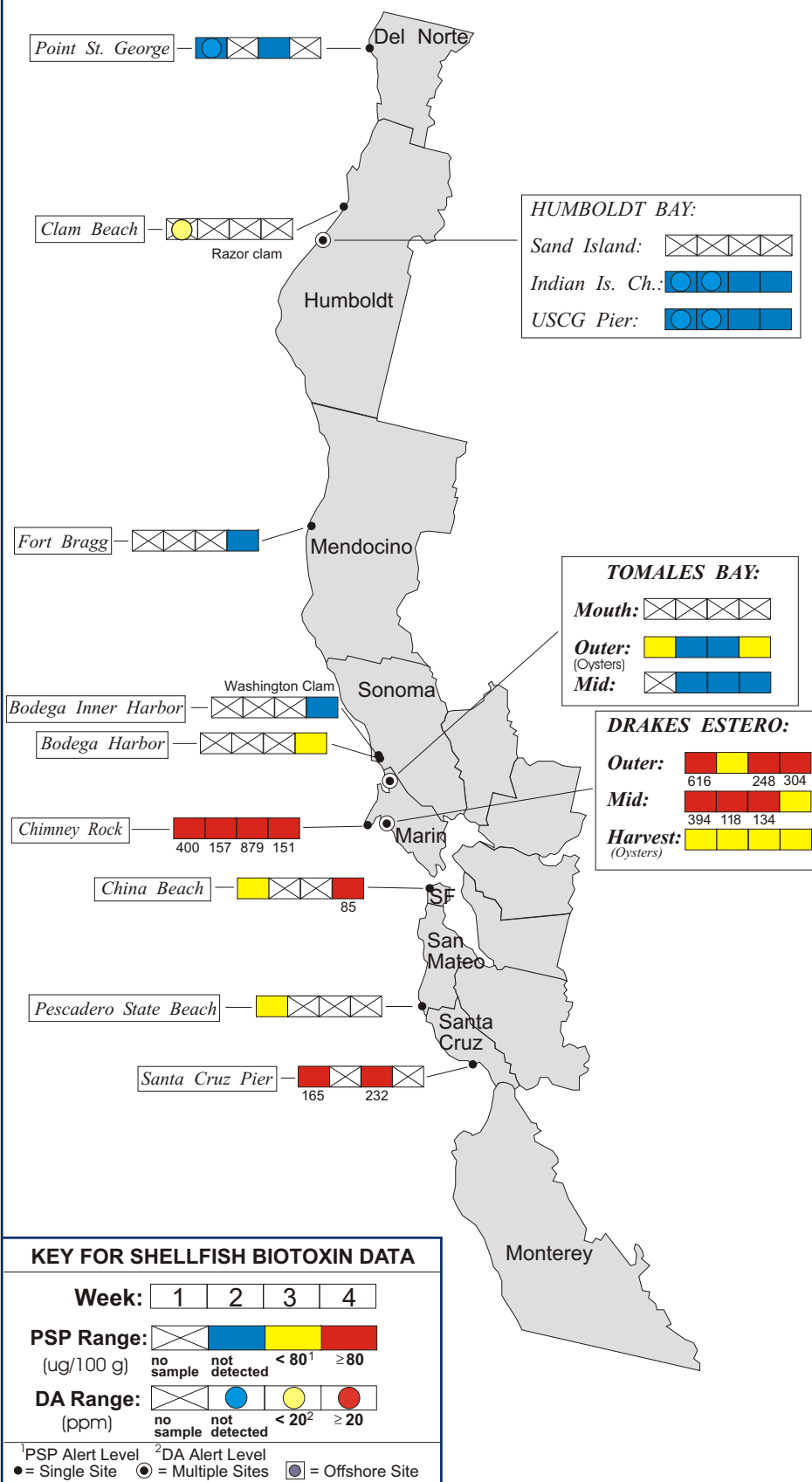


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during July, 2005.

COUNTY	AGENCY	# SAMPLES
<b>Del Norte</b>	Del Norte County Health Department	2
<b>Humboldt</b>	Coast Seafood Company	8
<b>Mendocino</b>	Mendocino County Environmental Health Department	1
<b>Sonoma</b>	California Department of Fish and Game	2
	DHS Marine Biotoxin Monitoring Program	2
<b>Marin</b>	Cove Mussel Company	3
	Hog Island Oyster Company	5
	Johnson Oyster Company	37
	Marin Oyster Company	1
	DHS Marine Biotoxin Monitoring Program	5
<b>San Francisco</b>	San Francisco County Health Department	2
<b>San Mateo</b>	San Mateo County Environmental Health Department	1
<b>Santa Cruz</b>	U.C. Santa Cruz	2
<b>Monterey</b>	None Submitted	
<b>San Luis Obispo</b>	Williams Shellfish Company	8
	Cal Poly	3
<b>Santa Barbara</b>	Santa Barbara Mariculture Company	6
	U.C. Santa Barbara	4
	Vanderberg AFB	1
<b>Ventura</b>	Ventura County Environmental Health Department	1
<b>Los Angeles</b>	Los Angeles County Health Department	1
	Los Angeles Regional Water Quality Control Board	1
	University of Southern California	2
<b>Orange</b>	None Submitted	
<b>San Diego</b>	Carlsbad Aquafarms, Inc.	4
	U.S. Navy	1
	Scripps Institution of Oceanography	4

(Continued from Page 4)

anchovies, lobster (also known as lobster "tomale"), and crab (sometimes called crab "butter") from Ventura County. This advisory was issued after dangerous levels of domoic acid were detected from this region.

The annual quarantine on the sport-harvesting of mussels went into effect on May 1 and will continue through October 31. The annual mussel quarantine applies only to sport-harvested mussels along the entire California coastline, including all bays and estuaries. Routine biotoxin monitoring is maintained throughout this period. The annual quarantine does not affect the certified commercial shellfish growing areas in California.

Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat.

Consumers are also advised that cooking does not eliminate the toxins from the shellfish tissue. Sport-harvesters are encouraged to contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.





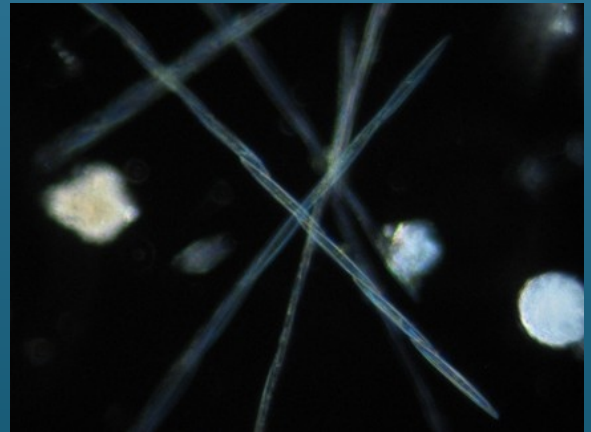
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during July, 2005.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	4
	DHS Volunteer (Jacki Riley)	3
Mendocino	None Submitted	
Sonoma	DHS Volunteer (Cathleen Cannon)	2
	Cordell Banks National Marine Sanduary	1
	DHS Marine Biotoxin Monitoring Program	1
Marin	DHS Volunteers (Brent Anderson, Mary VonTolsdorf, Marjorie Siegel, Richard Plant, Cal Strobel)	15
	DHS Marine Biotoxin Monitoring Program	5
	Johnson Oyster Company	17
Contra Costa	DHS Marine Biotoxin Monitoring Program	1
San Francisco	DHS Volunteer (Eugenia McNaughton)	3
San Mateo	San Mateo County Environmental Health Department	1
	DHS Volunteer (Sandy Emerson)	1
Santa Cruz	U.C. Santa Cruz	4
	California Department of Parks and Recreation	5
	Santa Cruz County Environmental Health Department	3
Monterey	DHS Volunteer (Jerry Norton)	3
San Luis Obispo	DHS Volunteers (Renee and Auburn Atkins)	5
	Morro Bay National Estuary Program	6
	Cal Poly	3
Santa Barbara	U.C. Santa Barbara	4
	Santa Barbara Mariculture Company	3
	California Department of Parks and Recreation	3
	Vanderberg AFB	2
	National Park Service Channel Islands	2
	Catalina Tall Ships Expeditions	1
Ventura	Ventura County Environmental Health Department	1
	Catalina Tall Ships Expeditions	5
Los Angeles	Los Angeles County Health Department	3
	Catalina Tall Ships Expeditions	4
	City of Los Angeles Environmental Monitoring Division	1
	DHS Volunteer (Richard Weaver)	1
	Los Angeles County Sanitation District	4
	University of Southern California	1
Orange	DHS Volunteer (Debbie Karimoto)	2
San Diego	Scripps Institute of Oceanography	4
	DHS Volunteer (Paul Sims)	3

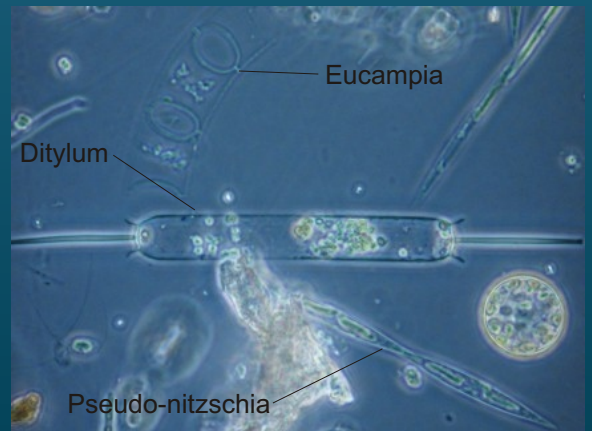
## PHYTOPLANKTON GALLERY



*Chaetoceros* was common along the northern and central coast.



The diatom *Pseudo-nitzschia* occurs in chains, with cells overlapping at the tips in a "stair-step" orientation.



A variety of diatoms were common along the coast in July.